

MAXIMUM RESISTANCE  
[mm. water-column height]

Type of gas mask	Inhalation		Exhalation
	Initial	Final <sup>1</sup>	
Front-mounted or back-mounted (without particulate filter) .....	60	75	20
Front-mounted or back-mounted (with approved particulate filter) .....	70	85	20
Chin-style (without particulate filter) .....	40	55	20
Chin-style (with approved particulate filter) .....	65	80	20
Escape (without particulate filter) .....	60	75	20
Escape (with approved particulate filter) .....	70	85	20

<sup>1</sup> Measured at end of the service life specified in Tables 5, 6, and 7 of this subpart.

**§ 84.123 Exhalation valve leakage test.**

(a) Dry exhalation valves and valve seats will be subjected to a suction of 25 mm. water-column height while in a normal operating position.

(b) Leakage between the valve and valve seat shall not exceed 30 milliliters per minute.

**§ 84.124 Facepiece tests; minimum requirements.**

(a) The complete gas mask will be fitted to the faces of persons having varying facial shapes and sizes.

(b) Where the applicant specifies a facepiece size or sizes for the gas mask, together with the approximate measurements of faces they are designed to fit, the Institute will insure that test subjects suit such facial measurements.

(c) Any gas mask parts which must be removed to perform the facepiece or mouthpiece fit test shall be replaceable without special tools and without disturbing the facepiece or mouthpiece fit.

(d) The facepiece or mouthpiece fit test, using positive or negative pressure recommended by the applicant and described in his instructions will be used before each test specified in paragraph (e) of this section, and in § 84.125.

(e)(1) Each wearer will enter a chamber containing 100 p.p.m. isoamyl acetate vapor for a half-mask facepiece and 1,000 p.p.m. isoamyl acetate vapor for a full facepiece or mouthpiece.

(2) The facepiece or mouthpiece may be adjusted, if necessary, in the test chamber before starting the tests.

(3) Each wearer will remain in the chamber for 8 minutes while performing the following activities:

(i) Two minutes, nodding and turning head;

(ii) Two minutes, calisthenic arm movements;

(iii) Two minutes, running in place; and

(iv) Two minutes, pumping with a tire pump into a 28 liter (1 cubic foot) container.

(4) Each wearer shall not detect the odor of isoamyl acetate during the test.

**§ 84.125 Particulate tests; canisters containing particulate filters; minimum requirements.**

Gas mask canisters containing filters for protection against particulates (e.g. dusts, fumes, mists, and smokes) in combination with gases, vapors, or gases and vapors, shall also comply with the requirements as prescribed in §§ 84.170 through 84.183, except for the airflow resistance test of § 84.181.

**§ 84.126 Canister bench tests; minimum requirements.**

(a)(1) Bench tests, except for carbon monoxide tests, will be made on an apparatus that allows the test atmosphere at 50±5 percent relative humidity and room temperature (25±2.5 °C.) to enter the canister continuously at concentrations and rates of flow specified in Tables 5, 6, and 7 of this subpart.

(2) Three canisters will be removed from containers and tested as received from the applicant.

(3) Two canisters, other than those described in paragraph (a)(2) of this section, will be equilibrated at room temperature by passing 25 percent relative humidity air through them at 64 liters per minute for 6 hours.

(4) Two canisters, other than those described in paragraphs (a) (2) and (3)

of this section, will be equilibrated at room temperature by passing 85 percent relative humidity air through them at 64 liters per minute for 6 hours.

(5) The equilibrated canisters will be resealed, kept in an upright position at room temperature, and tested within 18 hours.

(b) Front-mounted and back-mounted gas mask canisters will be tested and shall meet the minimum requirements set forth in Table 5 of this subpart.

(c)(1) Front-mounted, and back-mounted, and chin-style canisters designated as providing respiratory protection against gases, ammonia, organic vapors, carbon monoxide and particulate contaminants shall have a window or other indicator to warn the

gas mask wearer when the canister will no longer satisfactorily remove carbon monoxide from the inhaled air.

(2) Other types of front- and back-mounted canisters may also be equipped with a window or other indicator to warn of imminent leakage of other gases or vapors.

(3) The window indicator canisters will be tested as regular canisters, but shall show a satisfactory indicator change or other warning before the allowable canister penetration has occurred.

(d) Chin-style gas mask canisters shall meet the minimum requirements set forth in Table 6 of this subpart.

(e) Escape gas mask canisters shall meet the minimum requirements set forth in Table 7 of this subpart.

TABLES TO SUBPART I OF PART 84

TABLE 5—CANISTER BENCH TESTS AND REQUIREMENTS FOR FRONT-MOUNTED AND BACK-MOUNTED GAS MASK CANISTERS  
[42 CFR part 84, subpart I]

Canister type	Test condition	Test atmosphere			Number of tests	Maximum allowable penetration (parts per million)	Minimum service life (minutes) <sup>1</sup>
		Gas or vapor	Concentration (parts per million)	Flow rate (liters per minute)			
Acid gas .....	As received Equilibrated	SO <sub>2</sub>	20,000	64	3	5	12
		Cl <sub>2</sub>	20,000	64	3	5	12
		SO <sub>2</sub>	20,000	32	4	5	12
		Cl <sub>2</sub>	20,000	32	4	5	12
Organic vapor .....	As received Equilibrated	CCl <sub>4</sub>	20,000	64	3	5	12
		CCl <sub>4</sub>	20,000	32	4	5	12
Ammonia .....	As received Equilibrated	NH <sub>3</sub>	30,000	64	3	50	12
		NH <sub>3</sub>	30,000	32	4	50	12
Carbon monoxide .....	As received Equilibrated	CO	20,000	<sup>4</sup> 64	2	( <sup>3</sup> )	60
		CO	5,000	<sup>2</sup> 32	3	( <sup>3</sup> )	60
		CO	3,000	<sup>2</sup> 32	3	( <sup>3</sup> )	60
Combination of 2 or 3 of above types <sup>5</sup>							
Combination of all above types <sup>6</sup>							

<sup>1</sup> Minimum life will be determined at the indicated penetration.

<sup>2</sup> Relative humidity of test atmosphere will be 95±3pct; temperature of test atmosphere will be 25±2.5 °C.

<sup>3</sup> Maximum allowable CO penetration will be 385 cm<sup>3</sup> during the minimum life. The penetration shall not exceed 500 p/m during this time.

<sup>4</sup> Relative humidity of test atmosphere will be 95±3pct; temperature of test atmosphere entering the test fixture will be 0±2.5 °C–0 °C.

<sup>5</sup> Test conditions and requirements will be applicable as shown in this table.

<sup>6</sup> Test conditions and requirements will be applicable as shown in this table, except the minimum service lives for acid gas, organic vapor, and ammonia will be 6 min instead of 12 min.

TABLE 6—CANISTER BENCH TESTS AND REQUIREMENTS FOR CHIN-STYLE GAS MASK CANISTERS  
[42 CFR part 84, subpart I]

Canister type	Test condition	Test atmosphere			Number of tests	Maximum allowable penetration (parts per million)	Minimum service life (minutes) <sup>1</sup>
		Gas or vapor	Concentration (parts per million)	Flow rate (liters per minute)			
Acid gas .....	As received Equilibrated	SO <sub>2</sub>	50,000	64	3	5	12

TABLE 6—CANISTER BENCH TESTS AND REQUIREMENTS FOR CHIN-STYLE GAS MASK CANISTERS—  
Continued

[42 CFR part 84, subpart I]

Canister type	Test condition	Test atmosphere			Number of tests	Maximum allowable penetration (parts per million)	Minimum service life (minutes) <sup>1</sup>
		Gas or vapor	Concentration (parts per million)	Flow rate (liters per minute)			
Organic vapor .....	As received Equilibrated	Cl <sub>2</sub>	5,000	64	3	5	12
		SO <sub>2</sub>	5,000	32	4	5	12
		Cl <sub>2</sub>	5,000	32	4	5	12
		CCl <sub>4</sub>	5,000	64	3	5	12
Ammonia .....	As received Equilibrated	CCl <sub>4</sub>	5,000	32	4	5	12
		NH <sub>3</sub>	5,000	64	3	50	12
	As received Equilibrated	NH <sub>3</sub>	5,000	32	4	50	12
Carbon monoxide .....	As received	CO	20,000	≥ 64	2	( <sup>3</sup> )	60
		CO	5,000	≥ 32	3	( <sup>3</sup> )	60
		CO	3,000	≥ 32	3	( <sup>3</sup> )	60
Combination of 2 or 3 of above types <sup>5</sup>							
Combination of all above types <sup>6</sup>							

<sup>1</sup> Minimum life will be determined at the indicated penetration.<sup>2</sup> Relative humidity of test atmosphere will be 95±3pct; temperature of test atmosphere will be 25±2.5 °C.<sup>3</sup> Maximum allowable CO penetration will be 385 cm<sup>3</sup> during the minimum life. The penetration shall not exceed 500 p/m during this time.<sup>4</sup> Relative humidity of test atmosphere will be 95±3pct; temperature of test atmosphere entering the test fixture will be 0±2.5 °C—0° C.<sup>5</sup> Test conditions and requirements will be applicable as shown in this table.<sup>6</sup> Test conditions and requirements will be applicable as shown in this table, except the minimum service lives for acid gas, organic vapor, and ammonia will be 6 min instead of 12 min.

TABLE 7—CANISTER BENCH TESTS AND REQUIREMENTS FOR ESCAPE GAS MASK CANISTERS

[42 CFR part 84, subpart I]

Canister type	Test condition	Test atmosphere			Number of tests	Maximum allowable penetration (parts per million)	Minimum service life (minutes) <sup>1</sup>
		Gas or vapor	Concentration (parts per million)	Flow rate (liters per minute)			
Acid gas .....	As received .....	SO <sub>2</sub>	5,000	64	3	5	12
	Equilibrated .....	Cl <sub>2</sub>	5,000	64	3	5	12
		SO <sub>2</sub>	5,000	32	4	5	12
Organic vapor .....	As received .....	Cl <sub>2</sub>	5,000	32	4	5	12
		CCl <sub>4</sub>	5,000	64	3	5	12
		CCl <sub>4</sub>	5,000	32	4	5	12
Ammonia .....	As received .....	NH <sub>3</sub>	5,000	64	3	50	12
	Equilibrated .....	NH <sub>3</sub>	5,000	32	4	50	12
		NH <sub>3</sub>	5,000	32	4	50	12
Carbon monoxide .....	As received .....	CO	10,000	<sup>2</sup> 32	2	( <sup>3</sup> )	<sup>4</sup> 60
		CO	5,000	<sup>5</sup> 32	3	( <sup>3</sup> )	60
		CO	3,000	<sup>2</sup> 32	3	( <sup>3</sup> )	60

<sup>1</sup> Minimum life will be determined at the indicated penetration.<sup>2</sup> Relative humidity of test atmosphere will be 95 ±3 pct; temperature of test atmosphere will be 25 ±2.5 °C.<sup>3</sup> Maximum allowable CO penetration will be 385 cm<sup>3</sup> during the minimum life. The penetration shall not exceed 500 p/m during this time.<sup>4</sup> If effluent temperature exceeds 100° C during this test, the escape gas mask shall be equipped with an effective heat exchanger.<sup>5</sup> Relative humidity of test atmosphere will be 95 ±3 pct; temperature of test atmosphere entering the test fixture will be 0 ±2.5 °C—0 °C.